A Global Strategy
for the conservation and use of Coconut Genetic Resources
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COGENT
Coconut genetic resources for enhanced livelihoods

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3.6.2. Transfer of germplasm via embryo culture and pollen

As pointed out in section 2.2.4, the application of embryo culture to international germplasm transfers needs further review and refinement, together with strong concerted capacity building. A recent Trust-funded project clearly demonstrated that coconut embryo transfer is only feasible where the provider and recipient have sufficient capacity and other resources to strictly apply the recommended protocol. *Further support is needed to build such capacity and resources within many of the coconut genebanks*.

As discussed in section 2.6.3, from a global perspective, access to crop genetic resources has been recently subject to various forms of exclusive technological and legal restrictions. Thus, it seems very important for countries and stakeholders *to be allowed to receive coconut germplasm even if they do not have facilities and expertise* for *in vitro* culture of coconut embryos. A solution could be to cultivate the plantlets *in vitro* up to the stage where they are ready to be removed from the tubes and transferred to the nursery; then to send young plantlets in sealed tubes to the receiving country and stakeholders. This will need further research and the publication of simple guidelines explaining how to cultivate these young plantlets after removal from the tubes.

International transfer of pollen is the cheapest way for exchanging germplasm and the fastest way to include this germplasm in breeding programmes. So, another research area will be to optimize international transfers of pollen. Even if previous studies indicate that the exchange of pollen is a safe method, there is a need to re-assess the risks of transmission of pest and disease via coconut pollen.

3.6.3. Disease indexing and quarantine centres

Pest and diseases seriously constrain or even prevent international germplasm movement. Germplasm collected as embryos and pollen often needs to be transferred from the surveyed country to other countries hosting genebanks. This germplasm should preferably transit by quarantine centre(s). Such centre(s) will grow the embryos into plantlets, conduct disease indexing and securely transfer the germplasm to genebanks around the world.

Where to locate these future quarantine centres? If a coconut lethal disease exists within a country hosting a quarantine centre, the entire quarantine process needs a reinforced and fully isolation protocol, with no contact between embryos, plantlets and the exterior. Thus, quarantine centres could also be located out of the coconut production area. On the other hand, research on disease indexing need also be pursued; it is easier to conduct such research close to the disease-infected areas. For an economy of scale, it seems also interesting to merge these quarantine centres with cryopreservation facilities for embryos and pollen. One centre, at least, should serve both as quarantine and cryogenebank.

Two options are to consider a unique site serving both as quarantine centre and cryogenebank, or to organize disease indexing centres in a more regional basis. In this last case, each or some of the world regions (such as Africa, America, Asia, Europe, Oceania) could host a quarantine centre. Feasibility studies will assess these options. It

would be preferable that these activities will not be implemented in newly built centres, but by adding a coconut component to the facilities already existing for other crops.

As discussed in section 3.3.4 on cryogenebanking, disease indexing centre(s) will be located in the first country(ies) which, in accordance with COGENT and other institutions, will:

- agree to devote appropriate funding to this crucial facility with expected support from international agencies,
- develop consistent research and capability for coconut disease indexing,
- ensure that the germplasm will be kept in trust and safely transferred to recipient countries and stakeholders,
- and preferably also agree to host a cryogenebank.

COGENT will support developing such international quarantine centres in areas preferably (but not necessarily) free from lethal coconut disease.

3.7 Promoting the use of coconut genetic resources

In the light of promoting the effective use of coconut genetic resources, this section considers the following important elements: global objectives in terms of planting material; promoting farmer-produced and certified varieties; germplasm characterization and evaluation; international breeding trials, and the development of coconut clones whenever possible.

3.7.1 Global objectives in terms of planting material

The current status of coconut planting material production has been outlined in section 2.5.1. However, there is a need to assess more precisely the amount, type and quality of the coconut-planting material produced by national institutions, private companies and, especially, farmers. Information regarding the planting material will need to be widely disseminated among stakeholders.

As pointed out in section 2.5.2, farmers are collectively much more involved in coconut breeding and seednut production than scientists are. Farmers produce more than 80% of the planting material by themselves from the varieties they breed and conserve.

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For sure, COGENT does not advocate a situation where farmers become only diversity *users*, and where all conservation and breeding is implemented by national institutions or large private companies, as illustrated by the example of maize in 'Western' countries.

The question of global objectives in terms of planting material has been debated at various levels. Even if COGENT exerts influence on coconut-planting material at global level, its